



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/736,015      | 12/15/2003  | Nobutaka Ihara       | 0941.68799          | 4153             |

7590 09/06/2006  
Patrick G. Burns  
Greer, Burns & Crain, Ltd.  
Suite 2500  
300 South Wacker Drive  
Chicago, IL 60606

| EXAMINER |
|----------|
|----------|

KLIMOWICZ, WILLIAM JOSEPH

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2627

DATE MAILED: 09/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/736,015

Applicant(s)

IHARA ET AL.

Examiner

William J. Klimowicz

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 7-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continuation***

This examined application is a divisional of U.S. Patent Application No. 09/799,949 filed on March 6, 2001, now U.S. patent No. 6,700,761.

The Applicants have voluntarily cancelled claims 1-6, 10 and 11.

Claims 7-9 are currently pending.

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on August 18, 2006 has been entered.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 7 is rejected under 35 U.S.C. 102(b) as being anticipated by Johnson (US 5,654,566).

Art Unit: 2627

As per claim 7, Johnson (US 5,654,566) discloses a magnetic head sensor (e.g., see FIG. 4 in conjunction with FIG. 6B; see also col. 8, ll. 4-6 and col. 14, ll. 22-25) that senses an external magnetic field using a spin-filtered sensor current flowing (I) through a non-magnetic layer (e.g., 112; 204, 208); and further comprising: a pair of ferromagnetic bodies (F1, F2; 220, 230) provided on the non-magnetic layer (112; 204, 208) and positioned parallel to an axes of magnetization (118, 120) of each of the ferromagnetic bodies (F1, F2; 220, 230); and a power source (e.g., voltage source -  $V_R$ ) that uses the ferromagnetic bodies (F1, F2; 220, 230) as electrodes to supply the sensor current (I); wherein: the non-magnetic layer (112; 204, 208) is formed of a semiconductor material; and the axis of magnetization (e.g., 120) of one of the pair of ferromagnetic bodies (F2; 230) changes so as to detect an external magnetic field, and wherein said semiconductor material constituting said non-magnetic layer (e.g., 112; 204, 208) causes to flow a current (I) therethrough from one of said ferromagnetic bodies (F1, F2; 220, 230) to the other of said ferromagnetic bodies (F1, F2; 220, 230), said magnetic head being used with a magnetic recording/reproducing apparatus for detecting a signal from a magnetic recording medium.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2627

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 5,654,566).

See the description of Johnson (US 5,654,566), *supra*.

As per claims 8 and 9, Johnson (US 5,654,566) remains silent with respect to wherein the semiconductor material is indium aluminum arsenide or indium gallium arsenide, respectively.

Official notice is taken that magnetic sensors of the type disclosed by Johnson (US 5,654,566) wherein the semiconductor material is indium aluminum arsenide or indium gallium arsenide, is notoriously old and well known and ubiquitous in the art; such Officially noticed fact being capable of instant and unquestionable demonstration as being well-known.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the semiconductor material of Johnson (US 5,654,566) as being either of indium aluminum arsenide or indium gallium arsenide, as is known.

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the semiconductor material of Johnson (US 5,654,566) as being either of indium aluminum arsenide or indium gallium arsenide, as is known in order to provide enhanced ohmic contact and/or a desired/prescribed level of channel conductivity between the source and drain, in a matter that is well known, established and appreciated in the art.

### ***Response to Arguments***

Applicants' arguments filed August 18, 2006 have been fully considered but they are not persuasive.

Art Unit: 2627

The Applicants allege, at pp. 4-5 of the Response and Amendment filed on August 18, 2006 (Applicants' emphasis):

In MRAM devices, such as those taught by Johnson, it is known that such technology will necessarily have to select a specific memory cell. The magnetic spin injected-FET structure disclosed by Johnson is not specifically described, however, to be a magnetic sensor that detects an external magnetic field, as is the case with the magnetic head now more clearly recited in claim 7 of the present Application.

Johnson repeatedly teaches that its device is used to write information, in the form of magnetization, in the ferromagnetic electrode 116 when in the writing mode. (See col. 12, lines 48-62). Johnson's device reads information differently, however, in the reading mode. Johnson discloses that magnetic information is read by way of detection of a sensing current provided to the read line 354 (See Fig. 7B), or to the sense circuit 380 (see Fig. 7C). Magnetization in the ferromagnetic electrode 116 is therefore not influenced by an external magnetic field, and Johnson even several times teaches against such occurrences.

According to the present invention, on the other hand, the magnetic head is used with a magnetic recording/reproducing apparatus that detects a signal from a magnetic recording medium. As discussed above, not only does Johnson fail to teach such use, Johnson even teaches away from these amended claim features. The present invention is thus capable of avoiding the necessary selection transistor that Johnson integrates with a magnetic head. Accordingly, Applicants submit that Johnson does not read upon the present invention, and therefore the outstanding rejection should be withdrawn at least in light of these amendments.

Claims 8 and 9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson. Applicants respectfully traverse this rejection for at least the reasons discussed above. Claims 8 and 9 both depend from independent claim 7, and therefore include all of the features of the base claim, plus additional features.

The Examiner respectfully disagrees with the Applicants based on the invention, as presently claimed, the disclosure of Johnson (US 5,654,566), and patent law.

Art Unit: 2627

More concretely, as per amended claim 7, the claim sets forth “[a] magnetic head” *per se*. That is, claim 7 unambiguously and without question is drawn to a magnetic head, and not a magnetic head in combination with a recording apparatus - see claim 7, line 1. Amended claim 7, further goes on to recite in the body of the claim that “said magnetic head being used with a magnetic recording/reproducing apparatus for detecting a signal from a magnetic recording medium.” See claim 7, ll. 14-15.

This limitation is nothing more than an intended use limitation, given that claim 7 is drawn to a magnetic head, *per se*.

More concretely, assuming *arguendo* that Johnson (US 5,654,566) somehow fails to disclose a “magnetic head ... used with a magnetic recording/reproducing apparatus for detecting a signal from a magnetic recording medium,” Johnson (US 5,654,566) nevertheless anticipates claim 7, since there is no positive recitation of an magnetic recording/reproducing apparatus and a magnetic recording medium that results in a structural difference between the claim and Johnson (US 5,654,566). As has been widely held in patent law, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

More to the point, however, is the fact that Johnson (US 5,654,566) does indeed disclose a “magnetic head ... being used with a magnetic recording/reproducing apparatus for detecting a signal from a magnetic recording medium.” As disclosed at col. 8, ll. 4-6 of Johnson (US 5,654,566), “[i]n a magnetic sensor embodiment of the present invention, the spin injected FET

can be incorporated in a '*read*' head for *reading digital magnetic recorded data*."

Additionally, see col. 14, ll. 22-25, "[t]he device may also be used as a *field sensor*, e.g. in a *recording head*." Emphasis in bold italics added in both citations.

Thus, the facts clearly evidence that even if claim 7 were indeed to require a magnetic head positively in combination with a magnetic recording/reproducing apparatus for detecting a signal from a magnetic recording medium, Johnson (US 5,654,566) would still anticipate claim 7.

The Applicants further allege at page 5 of their Response:

As further discussed previously, and above, the advantageous structure of the present invention is able to avoid the additional elements required with Johnson's device, including the application of a gate voltage to the gate electrode, and the addition of a selection transistor integral with a magnetic head. These advantages are distinct, and have not been challenged by the Examiner on the record. Accordingly, the obviousness rejection should be withdrawn for at least these reasons as well.

As the Examiner has previously maintained, there is absolutely nothing in the claimed invention that would structurally or functionally preclude a gate electrode. That is, while the gate electrode affects the ability of the current to flow through the semiconductor material, the semiconductor material constituting the non-magnetic layer (e.g., 112; 204, 208) causes to flow a current (I) therethrough from one of said ferromagnetic bodies (F1, F2; 220, 230) to the other of said ferromagnetic bodies (F1, F2; 220, 230). For if the semiconductor were not formed, there could be no current at all.

The Examiner notes that the claim preamble includes the transitional term "comprising" (i.e., a "magnetic sensor that senses an external magnetic field using a spin-filtered sensor current flowing through a non-magnetic layer, *comprising*").



Art Unit: 2627

As pointed out in case law and MPEP § 2111.03, such transitional language does not preclude elements other than those specifically claimed. MPEP § 2111.03 states:

The transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 327 F.3d 1364, 1368, 66 USPQ2d 1631, 1634 (Fed. Cir. 2003) ("The transition 'comprising' in a method claim indicates that the claim is open-ended and allows for additional steps."); *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997) ("Comprising" is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim.); *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986); *In re Baxter*, 656 F.2d 679, 686, 210 USPQ 795, 803 (CCPA 1981); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 1948) ("comprising" leaves "the claim open for the inclusion of unspecified ingredients even in major amounts").

Thus, the fact that Johnson (US 5,654,566) uses a gate electrode to control current flow through the sensor, in no way is precluded by the claims as currently amended.

Again, it is noted that the Applicants have not seasonably challenged the Examiner's position regarding the use of Official notice as taken in the previous Office action (mailed June 23, 2005) by requesting "a demand for evidence."

As has been established in patent practice, as articulated in the MPEP § 2144.03:

If applicant does not seasonably traverse the well known statement during examination, then the object of the well known statement is taken to be admitted prior art. *In re Chevenard*, 139 F.2d 71, 60 USPQ 239 (CCPA 1943). A seasonable challenge constitutes a demand for evidence made as soon as practicable during prosecution. Thus, applicant is charged with rebutting the well known statement in the next reply after the Office action in which the well known statement was made. This is necessary because the examiner must be given the opportunity to provide evidence in the next Office action or explain why no evidence is required. If the examiner adds a reference to the rejection in the next action after applicant's rebuttal, the newly cited reference, if it is added merely as evidence of the prior well known statement, does not result in a new

Art Unit: 2627

issue and thus the action can potentially be made final. If no amendments are made to the claims, the examiner must not rely on any other teachings in the reference if the rejection is made final.

Since the Applicants did not seasonably traverse the well known statement during examination, the object of the well known statement has been taken to be admitted prior art.

### ***Conclusion***

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

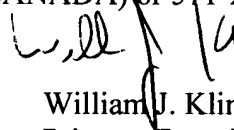
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Art Unit: 2627

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William J. Klimowicz whose telephone number is (571) 272-7577. The examiner can normally be reached on Monday-Thursday (6:30AM-5:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Thi Nguyen can be reached on (571) 272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
William J. Klimowicz  
Primary Examiner  
Art Unit 2627

WJK